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Wintering Steers With and Without Corn Silage Preparatory to Finishing on Grass Without Grain

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BULLETIN NO. 267

Wintering Steers With and Without Corn Silage Preparatory to Finishing on Grass Without Grain

By E. S. GOOD

PURPOSE OF THE EXPERIMENT

Central Kentucky has long been noted for its luxuriant pastures of nutritious bluegrass. These pastures are enriched early in the season by white clover which is so abundant in some years as to make a bluegrass pasture white in appearance. Cattle have been fattened on bluegrass pastures in Kentucky for the past one hundred twenty-five years or more. The custom has been to feed a sufficient amount of corn and roughage during the winter to make a substantial gain and finish the steers on grass the following summer without grain.

Since the introduction of the silo some twenty years ago, the question has often been raised as to whether the steer will make as good a gain on grass without grain after having had silage during the previous winter as he would make if fed a ration during the winter containing no silage. It was to obtain data on this subject that the experiments herein reported were conducted. It was the object of these tests to note the effect of corn silage as a part of the ration fed to steers during the winter and early spring months on their functional ability to make gains the following summer on grass without grain as compared with steers which made similar gains during the winter and spring months on a ration containing no silage and pastured the following summer without grain. It was also the object to determine the comparative economy of the two systems of feeding.

During the winter the steers were confined in the dry lot. Three consecutive experiments were conducted. The first ex-

periment was conducted in the year 1914, the second experiment in the late winter of 1914 and spring and summer of 1915, and the third experiment in the late winter of 1915 and spring and summer of 1916.

PLAN

In each of the experiments, with one exception, 20 steers were used, divided into two lots of 10 steers each, as nearly alike as possible as to size, grade, quality, condition and breeding. The exception noted as to the number used in a lot was that of the first experiment when 11 steers instead of 10 were used in the lot receiving corn silage. In each experiment one lot of steers received a ration during the winter and early spring months containing corn silage, while the other, the check lot, did not receive silage, but was given a sufficient amount of feed stuffs to produce gains about equal to those made by the steers which received corn silage in their ration. In the spring these steers were turned together into a bluegrass pasture. They were identified by means of a leather collar carrying a metal tag with a number indented on its surface. No grain was fed to the steers while on pasture.

In the first two experiments two-year-old feeders were used and sold from pasture to be slaughtered at the end of the experiment. Yearlings were used for the third experiment and were used as feeders at the end of the test. In this bulletin, lot 1 will always be the one which received corn silage during the winter and lot 2 the one which did not receive silage.

FEEDS USED

Rations fed while the steers were in the dry lot in these trials consisted of various combinations of cottonseed meal, corn, corn stover, silage, cottonseed hulls, clover hay and oat straw. The steers in lot 2 did not receive silage during any one of the three tests. In the second test, lot 1 did not receive corn after the first 30 days and in the third test no corn was fed to lot 1 at any time.

Feeds used during the winter in each experiment are given below:

First experiment (1914) lot 1, cottonseed meal, broken ear corn, silage, clover hay, cottonseed hulls.

Lot 2 received the same ration without silage.

Second experiment (1914-1915) lot 1, cottonseed meal, broken ear corn (first 28 days only), silage, clover hay, oat straw, corn stover.

Lot 2, cottonseed meal, broken ear corn, cottonseed hulls.

Third experiment (1915-1916), lot 1, cottonseed meal, silage, clover hay, oat straw, corn stover.

Lot 2, cottonseed meal, broken ear corn, clover hay, oat straw, corn stover.

PRICES OF FEEDS

The feeds used were charged to the steers at the following prices:

	First Experiment (1914)	Second Experiment (1914-1915)	Third Experiment (1915-1916)
Cottonseed meal, per ton	$31.20	$29.50	$30.00
Corn, per bushel	.75	.75	.70
Corn silage, per ton	3.00	4.00	4.00
Clover hay, per ton	16.00		14.00
Pasture, per head, per month	3.00	2.50	2.50
Oat straw, per ton			6.00
Corn stover, per ton			3.00
Cottonseed hulls, per ton	9.85	9.00	

All the feeds were of good quality. The cottonseed meal analyzed 41 per cent protein.

HOGS

Pigs followed the lots of steers which received corn during the winter months.

SHELTER, FEED LOTS AND WATER SUPPLY

Each lot of steers was fed during the winter in an open shed 16 by 40 feet, facing south, with access to a concrete lot 40 by 43 feet.

Water was supplied at all times from the city waterworks to a galvanized tank. During the summer months the steers had the run of a good sixty-acre bluegrass pasture with water supplied by ever-running springs.

WEIGHTS

The steers were weighed each month during the winter and before and after going on pasture in the summer. In the winter the steers were weighed after a 12-hour shrink and when on pasture they were weighed early in the morning before they had access to water. Individual and group weights were taken.

METHOD OF FEEDING DURING THE WINTER

The method of feeding was the same in both lots. The steers were fed at 7 a. m. and 4 p. m., receiving roughage and concentrates at the same time. Salt was kept before the cattle at all times.

DESCRIPTION OF THE CATTLE

The cattle used in the first two trials were two-year-old grade Shorthorn, Hereford and Angus steers, grading as good feeders. Those used in the third trial were yearling steers of the same type and grade as those mentioned above.

METHOD OF VALUING THE CATTLE

The initial value of the cattle was based upon the purchase price. The valuation placed upon the cattle at the close of the experiment was the actual sale price for the steers used in the first two experiments. The steers used in the third test were used as feeders at the end of the experiment.

LABOR

No charge is made for the labor involved in caring for the steers during the winter months, nor is credit made for the manure produced by the steers.

First Experiment to Test the Ability of Cattle to Gain on Bluegrass Pasture without Grain, after Wintering on Rations With and Without Corn Silage

The trial reported in this experiment gives data on the rapidity and cost of gains, the finish produced and the net return when steers are fed a winter ration containing silage and finished on grass the following summer without grain, as compared with steers handled in a like manner but receiving no silage in the winter ration.

The two lots of steers were fed during the winter months so as to make them gain as nearly the same as possible. In the first experiment, the aim was to feed the steers in the winter so as to produce a gain of about 1.75 pounds per head daily.

TABLE I

Average Amount of Feed Consumed Daily Per Head During the Winter 1914

	Lot 1 Silage	Lot 2 No Silage
1st Period—28 days—		
Cottonseed meal	.80 lb.	.83 lb.
Broken ear corn	11.64 lbs.	14.21 lbs.
Silage	18.20 lbs.	
Clover hay	6.64 lbs.	10.67 lbs.
Cottonseed hulls	2.20 lbs.	2.28 lbs.
2nd Period—28 days—		
Cottonseed meal	.86 lb.	.97 lb.
Broken ear corn	9.37 lbs.	16.00 lbs.
Silage	18.40 lbs.	
Clover hay	1.88 lbs.	2.42 lbs.
Cottonseed hulls	2.64 lbs.	4.80 lbs.
3rd Period—31 days—		
Cottonseed meal	1.68 lbs.	1.74 lbs.
Broken ear corn	10.78 lbs.	15.87 lbs.
Silage	19.35 lbs.	
Clover hay	2.00 lbs.	1.98 lbs.
Cottonseed hulls	3.15 lbs.	5.01 lbs.

TABLE I—Continued

	Lot 1 Silage	Lot 2 No Silage
4th Period—32 days—		
Cottonseed meal	2.33 lbs.	2.50 lbs.
Broken ear corn	11.94 lbs.	16.00 lbs.
Silage	18.49 lbs.	
Clover hay	2.12 lbs.	2.09 lbs.
Cottonseed hulls	3.31 lbs.	5.98 lbs.

It will be seen from Table 1 that the amounts of cottonseed meal received by the two lots of steers were just about equal, but that the steers that received no silage were given a larger amount of corn, cottonseed hulls and clover hay in order to make them gain as much as the silage-fed steers. Cottonseed meal was increased gradually in both lots until the steers were turned on pasture.

TABLE II

Average Amount of Feed Consumed Per Pound Gain and Cost Per 100 Pounds Gain, During the Winter

	Lot 1 Silage	Lot 2 No Silage
Cottonseed meal	.85 lb.	.85 lb.
Broken ear corn	6.44 lbs.	8.63 lbs.
Silage	10.95 lbs.	
Clover hay	1.82 lbs.	2.30 lbs.
Cottonseed hulls	1.67 lbs.	2.53 lbs.
Cost per 100 pounds gain	$12.13	$13.64

From Table II it will be seen that the amount of cottonseed meal required to produce a hundred pounds of gain was the same in each lot, but that the steers that received silage required less corn, clover hay and cottonseed hulls per cwt. gain.

It will also be noted that the cost of producing a hundred pounds of gain was $1.51 less where silage was fed than where the steers received no silage.

TABLE III

Average Daily Gain Per Steer, by Periods, and Total Gains Per Steer

	Lot 1 Silage	Lot 2 No Silage
Number of steers per lot	11	10
Daily gains made in dry lot Jan. 7-May 5 (119 days)		
1st period (28 days)	2.59 lbs.	2.23 lbs.
2nd period (28 days)	.93 lb.	1.57 lb.
3rd period (31 days)	1.35 lbs.	1.38 lbs.
4th period (32 days)	1.93 lbs.	2.04 lbs.
Average gain per steer in dry lot—119 days	202.3 lbs.	215.0 lbs.
Average daily gain per steer in dry lot—119 days	1.70 lbs.	1.80 lbs.
Average gain per steer on pasture—71 days	66.00 lbs.	55.00 lbs.
Average daily gain per steer on pasture—71 days	.93 lb.	.77 lb.
Average gain per steer in dry lot and on pasture—190 days	268.30 lbs.	270.00 lbs.
Average daily gain per steer in dry lot and on pasture—190 days	1.41 lbs.	1.42 lbs.

From Table III it will be seen that Lot 1, the steers which received silage during the winter months, made about twelve pounds per steer less gain in the dry lot than did Lot 2, the steers which received no silage during the winter, but that when the two lots of steers were turned on pasture for 71 days in the summer the gains were reversed, lot 1 making 11 pounds per steer more gain than lot 2.

When winter and summer gains were both considered there were only about two pounds per steer difference in the gains made by the two lots, lot 1 gaining 268.3 pounds per steer and lot 2 270 pounds per steer, or an average daily gain per steer of 1.41 and 1.42 respectively.

As a matter of interest the weights of the two lots of steers as taken at different intervals while on pasture is hereby given. On June 6, lot 1 weighed 13,990 pounds; June 27, 14,735 pounds; July 10, 14,735 and July 16, 14,625 pounds. On June

6, lot 2 weighed 12,620 pounds; June 27,13,120 pounds; July 10, 13,140 pounds and July 16, 13,105. These steers were turned on pasture May 5 and by June 6 had made but small gains. Undoubtedly if these steers had been weighed at the end of the first two weeks on pasture it would have been found that they had actually shrunk during that time. After June 6, the steers began to make fair gains tho not as good gains as we had anticipated. It will also be noted that the steers in either lot did not weigh as much when sold July 16 as they did July 10 due, no doubt, to the partial depletion of the bluegrass pasture.

A summary of results in the feeding of these two lots of steers is given in Table IV.

TABLE IV

Summary of First Experiment

	Lot 1 Silage	Lot 2 No Silage
No. of steers in lot	11	10
Initial weight per steer Jan. 7	1,061 lbs.	1,040 lbs.
Weight per steer May 5, at end of dry lot feeding	1,264 lbs.	1,255 lbs.
Gain per steer in dry lot	203 lbs.	215 lbs.
Average daily gain per steer in dry lot	1.70 lbs.	1.80 lbs.
Average daily feed consumed per steer in dry lot:		
Cottonseed meal	1.45 lbs.	1.55 lbs.
Broken ear corn	10.96 lbs.	15.54 lbs.
Corn silage	18.62 lbs.	
Clover hay	3.10 lbs.	4.16 lbs.
Cottonseed hulls	2.85 lbs.	4.56 lbs.
Cost of feed per steer	$24.63	$29.34
Cost per cwt. of gain in dry lot	12.13	13.64
Pork produced per steer	35 lbs.	41 lbs.
Value of pork produced per steer @ $8 per cwt.	$2.80	$3.28
Weight per steer when sold July 16	1,330 lbs.	1,310 lbs.
Gain per steer on pasture	66 lbs.	55 lbs.
Average daily gain per steer on pasture	.93 lb.	.77 lb.
Average gain per steer in dry lot and on		

TABLE IV—Continued.

	Lot 1 Silage	Lot 2 No Silage
pasture	269 lbs.	270 lbs.
Average daily gain per steer in dry lot and on pasture (190 days)	1.41 lbs.	1.42 lbs.
Total cost of feeds and pasture per steer	$31.73	$36.44
Original cost per steer @ $7 per cwt.	74.27	72.80
Total cost per cwt. gain per steer	11.79	13.49
Necessary selling price per cwt., pork credited	$7.75	$8.08
Actual selling price per cwt.	8.16	8.16
Net return per steer, including pork, above cost of steers and feed	5.33	.93

Table IV is a summary of the first test in this experiment and gives results of both winter and summer work. It will be seen that the silage-fed steers made an average daily gain per steer of 1.70 pounds during the winter, at a cost of $12.13 per cwt. The lot of steers that received no silage made an average daily gain per steer of 1.80 pounds during the winter at a cost of $13.64 per cwt., or a difference of $1.51 less cost per cwt. gain for the lot receiving silage.

When turned on pasture the steers that had received silage during the winter gained 66 pounds per steer against 55 pounds per steer for those that had recived no silage. The small increase in gain on grass by the lot which received silage during the winter may have been due to the fact that this lot did not make quite as large gain during the winter months. At any rate, the results of this experiment show that the feeding of silage during the winter was followed by as good gains on pasture as were made by the lot which did not receive silage during the winter.

When both winter and summer gains are considered, the steers that received silage during the winter made within one pound per steer as much gain as did the steers receiving no silage

and at the same time produced 100 pounds of gain at $1.70 less cost and required a selling price of 33 cents less per cwt. to come out even. The silage lot gave a net return of $5.33 per head above cost of feed and cattle, while the other lot gave a net return of 93 cents per head.

Second Experiment to Test the Ability of Cattle to Gain on Bluegrass Pasture without Grain, after Wintering on Rations With and Without Corn Silage

The work in this experiment was a continuation of the experiment which was begun the previous winter. The steers used in this test were of the same age, grade and quality as those used in the first year's work. The method of handling the steers was also the same as that of the previous year, with the exception that both lots received less grain during the winter and that both the dry lot and the grazing periods were longer than were those of the first test. The steers were in the dry lot 173 days and on pasture 97 days, making a total of 270 days, which was 80 days longer than the test of the first year.

TABLE V

Average Amount of Feed Consumed Daily Per Head While in Dry Lots, November 25, 1914, to May 16, 1915 (173 days)

	Lot 1 Silage	Lot 2 No Silage
1st Period—28 days—		
Cottonseed meal	.957 lb.	.957 lb.
Broken ear corn	2.11 lbs.	5.71 lbs.
Silage	13.85 lbs.	
Cottonseed hulls	10.71 lbs.	12.83 lbs.
Corn stover		1.85 lbs.
2nd Period—28 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Broken ear corn		7.00 lbs.
Silage	25.00 lbs.	
Cottonseed hulls	12.78 lbs.	19.39 lbs.

TABLE V—Continued.

	Lot 1 Silage	Lot 2 No Silage
3rd Period—28 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Broken ear corn		5.07 lbs.
Silage	25.00 lbs.	
Cottonseed hulls	8.07 lbs.	15.00 lbs.
4th Period—28 days—		
Cottonseed meal	1.52 lbs.	1.52 lbs.
Broken ear corn		5.46 lbs.
Silage	25.00 lbs.	
Cottonseed hulls	3.35 lbs.	15.42 lbs.
5th Period—28 days—		
Cottonseed meal	1.58 lbs.	1.58 lbs.
Broken ear corn		7.00 lbs.
Silage	32.50 lbs.	
Cottonseed hulls	3.00 lbs.	18.00 lbs.
6th Period—33 days—		
Cottonseed meal	2.02 lbs.	2.02 lbs.
Broken ear corn		9.34 lbs.
Silage	35.00 lbs.	
Cottonseed hulls	3.00 lbs.	18.00 lbs.

In our opinion the steers in the first test were too fat when they went on grass for the most economical results. With this idea in mind, the rations fed in the dry lot were somewhat lighter in this experiment than the rations used in the previous test. In fact, the steers that received silage this year were given no corn after they were on a good feed of silage and those that received no silage got only about half as much corn as did those of the corresponding lot in the first experiment.

Less cottonseed meal was fed this year than in the previous test. No clover hay was fed. Roughage was supplied in the form of cottonseed hulls.

TABLE VI

Average Amount of Feed Consumed Per Pound Gain and Cost Per 100 Pounds Gain During the Winter

	Lot 1 Silage	Lot 2 No Silage
Cottonseed meal	1.09 lbs.	1.10 lbs.
Broken ear corn	.244 lb.	4.78 lbs.
Silage	18.80 lbs.	
Cottonseed hulls	.409 lb.	11.91 lbs.
Corn stover		.216 lb.
Cost per 100 pounds gain	$7.38	$11.80

From Table VI it will be seen that the amount of feed required to produce one pound of gain was much less in this test than in the one conducted the previous year. The cost of producing 100 pounds of gain was also much less this year. The reduction in cost was due to the fact that no hay was fed and the daily allowance of corn and cottonseed meal was reduced, thus cheapening the ration. The feeding of silage lessened the cost of winter gain $4.42 per cwt.

TABLE VII

Average Daily Gain Per Steer by Periods and Total Gains in Dry Lot and Pasture Per Steer

	Lot 1 Silage	Lot 2 No Silage
1st period—28 days	1.375 lbs.	1.63 lbs.
2nd period—28 days	.964 lb.	1.475 lbs.
3rd period—28 days	2.03 lbs.	1.32 lbs.
4th period—28 days	.214 lb.	.482 lb.
5th period—28 days	1.66 lbs.	1.535 lbs.
6th period—33 days	2.00 lbs.	1.786 lbs.
7th period—on pasture 97 days	1.266 lbs.	.762 lb.

TABLE VII—Continued.

	Lot 1 Silage		Lot 2 No Silage	
Average gain per steer in dry lot—173 days	243	lbs.	240	lbs.
Average daily gain per steer in dry lot—173 days	1.40	lbs.	1.387	lbs.
Average gain per steer on pasture—97 days	123	lbs.	74	lbs.
Average gain per steer in dry lot and on pasture (270 days)	366	lbs.	314	lbs.
Average daily gain per steer in dry lot and on pasture—270 days	1.36	lbs.	1.16	lbs.

From Table VII it will be seen that the gains made during the winter months by both lots of steers were somewhat less this year than were those of the previous test. This was due to the fact that less feeds such as corn, cottonseed meal and clover hay were supplied to the steers. The silage-fed steers made larger gains in the dry lot and on the pasture than did the steers that received no silage during the winter. The average gain per steer in lot 1 during the winter months was 243 pounds and on pasture 123 pounds, making a total of 366 pounds for the 270 days, or an average daily gain per steer of 1.36 pounds, while the average gain per steer in lot 2 was 240 pounds during the winter and 74 pounds on pasture, making a total of 314 pounds, or an average daily gain per steer for the 270 days of 1.16 pounds.

TABLE VIII

Summary of Second Experiment

	Lot 1 Silage		Lot 2 No Silage	
No. of steers in lot	10		10	
Initial weight per steer November 25	1,050	lbs.	1,045	lbs.
Weight per steer May 16 at end of dry lot feeding	1,293	lbs.	1,285	lbs.
Gains per steer in dry lot	243	lbs.	240	lbs.

TABLE VIII—Continued.

	Lot 1 Silage	Lot 2 No Silage
Average daily gain per steer in dry lot	1.40 lbs.	1.38 lbs.
Average daily feed consumed per steer in dry lot—		
Cottonseed meal	1.53 lbs.	1.53 lbs.
Broken ear corn	.342 lb.	6.78 lbs.
Corn silage	26.32 lbs.	
Cottonseed hulls	6.71 lbs.	16.48 lbs.
Corn stover		.29 lb.
Cost of feeds	$178.68	$282.69
Cost per cwt. gain in dry lot	7.38	11.80
Total pork produced	73.0 lbs.	81.0 lbs.
Cost of feed fed hogs	$46.12	$46.27
Net return gain pork produced, per steer	.75	1.33
Average weight per steer when turned on pasture May 17	1,293 lbs.	1,285 lbs.
Average weight per steer when sold Aug. 21	1,416 lbs.	1,359 lbs.
Gain per steer on pasture	123 lbs.	74 lbs.
Average daily gain per steer on pasture	1.26 lbs.	.76 lb.
Average gain per steer in dry lot and on pasture	366 lbs.	314 lbs.
Average daily gain per steer in dry lot and on pasture	1.36 lbs.	1.16 lbs.
Cost of feeds and pasture per steer	$25.69	$36.09
Original cost per steer @ $7.65 per cwt.	80.36	79.94
Total cost per cwt. gain per steer	7.03	11.51
Necessary selling price per cwt., pork credited	7.43	8.44
Actual selling price per cwt.	8.40	8.40
Net return per steer with pork credited, above cost of steer and feed	18.64	.55

Table VIII shows that both lots of steers made practically the same gains per steer during the winter. Lot 1 gained 243 pounds and lot 2 gained 240 pounds. It will also be noted that both lots were fed a light grain ration during the winter. Lot 1 was given only 11.5 bushels of corn per steer, 10.5 bushels of

which were estimated to be in the silage. Lot 2 was fed 15 bushels of corn during the winter. The amount of cottonseed meal given both lots during the winter was light.

The gain per steer on pasture was 123 pounds for lot 1 and 74 pounds for lot 2. Again the steers which received silage during the winter made the larger gains on pasture.

The total gain in the dry lot and on pasture was 366 pounds per steer for lot 1, which received silage during the winter, and 314 pounds per steer for lot 2, which did not receive silage during the winter.

Both lots of steers shrank in weight when first turned to pasture altho lot 1, which received silage during the winter, recovered its weight sooner than did lot 2. The weights of the steers taken at different intervals while on pasture are given below: The average weight per steer of lot 1, when turned on grass May 16, was 1,293 pounds; on May 31, 1,258 pounds; June 14, 1,315 pounds; June 28, 1,335 pounds; July 12, 1,330 pounds; July 26, 1,383 pounds; August 21, 1,416 pounds. Lot 2, when turned on pasture May 16, averaged 1,285 pounds per steer; May 31, 1,200 pounds; June 14, 1,250 pounds; June 28, 1,258 pounds; July 12, 1,308 pounds; July 26, 1,348 pounds; August 21, 1,359 pounds.

The total gain in the dry lot and on pasture was 366 pounds per steer for lot 1 and 314 pounds per steer for lot 2. Both lots of steers sold at the same price per hundredweight, altho lot 1 was in slightly higher condition. Altho a margin of only 75 cents per cwt. was obtained, lot 1 netted a return of $13.64 per steer above cost of cattle and feed, while there was a loss of $0.55 per steer with lot 2. In arriving at the returns or loss per steer, no charge was made for labor nor was credit given for the manure produced.

Third Experiment to Test the Ability of Cattle to Gain on Bluegrass Pasture without Grain, after Wintering on Rations With and Without Corn Silage

The steers used in the third test of this experiment were yearlings weighing between six and seven hundred pounds.

They were started on feed in the dry lot December 3, and were turned on pasture May 12, where they remained until October 20 of the same year, when they were brought into the barn and finished on dry feed. These yearlings were handled in practically the same way that the steers were handled in the two previous tests, one lot receiving silage during the winter and the other lot getting no silage; then all being turned together on a bluegrass pasture in the summer.

In this experiment, five of the twenty steers were killed by lightning after they were turned on pasture. Three of these steers were from lot 1 which received silage the previous winter and two from the lot which did not receive silage. In arriving at the statistics as given in the third experiment, the feed eaten and gains made by the five steers were eliminated. It was assumed that each steer ate the same amount of feed during the winter. The individual weights of the steers were taken at regular periods, thus giving the individual gains in both winter and summer. The tables giving the results of this experiment take into consideration the average data per steer. The following summary table gives the results of this experiment.

TABLE IX

Average Amount of Feed Consumed Daily Per Head During Winter 1915 and 1916, December 3–May 12

	Lot 1 Silage	Lot 2 No Silage
1st Period—26 days—		
Cottonseed meal	.64 lbs.	.64 lbs.
Broken ear corn		1.95 lbs.
Silage	12.69 lbs.	
Clover hay	1.73 lbs.	2.69 lbs.
Oat straw	5.98 lbs.	5.17 lbs.
Corn stover	15.18 lbs.	16.40 lbs.

TABLE IX—Continued.

	Lot 1 Silage	Lot 2 No Silage
2nd Period—26 days—		
Cotton seed meal	1.42 lbs.	1.42 lbs.
Broken ear corn		5.41 lbs.
Silage	22.50 lbs.	
Clover hay	4.51 lbs.	5.00 lbs.
Oat straw	5.46 lbs.	6.48 lbs.
Corn stover	3.64 lbs.	3.79 lbs.
3rd Period—32 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Shelled corn		5.22 lbs.
Silage	28.96 lbs.	
Clover hay	4.21 lbs.	5.00 lbs.
Oat straw	4.68 lbs.	4.54 lbs.
4th Period—28 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Shelled corn		6.21 lbs.
Silage	30.00 lbs.	
Clover hay	4.28 lbs.	5.00 lbs.
Oat straw	5.00 lbs.	9.49 lbs.
5th Period—28 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Shelled corn		7.00 lbs.
Silage	30.00 lbs.	
Clover hay	4.46 lbs.	4.82 lbs.
Oat straw	4.64 lbs.	7.67 lbs.
6th Period—21 days—		
Cottonseed meal	1.50 lbs.	1.50 lbs.
Shelled corn		7.00 lbs.
Silage	31.30 lbs.	
Clover hay	5.00 lbs.	5.00 lbs.
Oat straw	5.00 lbs.	5.09 lbs.

From Table IX it will be seen that the silage-fed steers did not receive corn during the winter, but that both lots were given the same amount of cottonseed meal and in addition were allowed clover hay, oat straw and corn stover. A rather liberal supply of feeds was used in this test as these yearlings required a good growing ration.

TABLE X

Average Amount of Feed Consumed Per Pound Gain and Cost Per 100 Pounds Gain During Winter

	Lot 1 Silage	Lot 2 No Silage
Cottonseed meal	.96 lb.	1.37 lbs.
Broken ear corn		1.20 lbs.
Shelled corn		4.30 lbs.
Silage	18.43 lbs.	
Clover hay	2.86 lbs.	4.65 lbs.
Oat straw	3.62 lbs.	6.51 lbs.
Corn stover	2.16 lbs.	3.30 lbs.
Cost per 100 pound gain	$8.17	$13.68

From Table X it will be seen that the amount of cottonseed meal required to make one pound of gain was over one-third more in lot 2 than in lot 1 and that the amount of clover hay and other roughages required was almost twice as much in lot 2 as in lot 1. In addition, the calves that did not receive silage consumed a considerable amount of high priced corn.

The cost of producing 100 pounds of gain was $8.17 where silage was fed and $13.68 where no silage was fed, being almost twice as much in this latter instance as in the former. From this table it will be seen that where other feeds were substituted for silage in the ration the cost of producing gains was considerably increased.

TABLE XI
Summary of Third Experiment

	Lot 1 Silage	Lot 2 No Silage
Initial weight per steer	671 lbs.	678 lbs.
Weight per steer May 11 at end of dry lot feeding	898 lbs.	837 lbs.
Average gain per steer in dry lot	227 lbs.	159 lbs.
Average daily gain	1.41 lbs.	.99 lb.
Average daily feed consumed per steer:		
Cottonseed meal	1.35 lbs.	1.35 lbs.
Broken ear corn		1.19 lbs.
Shelled corn		4.25 lbs.
Silage	25.98 lbs.	
Clover hay	4.03 lbs.	4.59 lbs.
Oat straw	5.11 lbs.	6.43 lbs.
Corn stover	3.04 lbs.	3.26 lbs.
Cost of feeds per steer	$18.56	$21.75
Cost per steer @ $7.25 per cwt.	48.64	49.15
Total cost per steer when turned on pasture	67.20	70.90
Cost per cwt. gain in dry lot	8.17	13.68
Pork produced per steer		12.00 lbs.
Value of pork produced per steer @ $9		$1.08
Necessary selling price per cwt. pork not included	7.48*	8.47
Necessary selling price pork included	7.48	8.22
Weight per steer when turned on grass	898.00 lbs.	837.00 lbs.
Weight per steer Nov. 20	1,093.00 lbs.	1,082.00 lbs.
Gain per steer on pasture	195.00 lbs.	245.00 lbs.
Average daily gain per steer on pasture	1.01 lbs.	1.27 lbs.
Total gain per steer in dry lot and on pasture	422.00 lbs.	404.00 lbs.
Average daily gain per steer in dry lot and on pasture	1.20 lbs.	1.14 lbs.
Total cost pasture per steer	$13.50	$13.50
Total cost feeds per steer in dry lot and on pasture	32.06	35.25
Total cost per cwt. gain	7.60	8.72
Necessary selling price per cwt. (pork included)	7.38	7.70

*No hogs followed the steers in Lot 1.

Table XI is a summary of the tests conducted in 1915 and 1916 and shows that the steers in lot 1 made during the winter months an average daily gain of 1.41 pounds at a cost of $8.17 per cwt., and would have required a selling price of $7.48 to come out even, while lot 2 made an average daily gain of .99 pound during the winter at a cost of $13.68 per cwt., and would have required a selling price of $8.22 (pork included) to come out even.

Lot 1 made an average daily gain of 1.01 pounds on pasture, while lot 2 made a daily gain of 1.27 pounds on pasture. When both winter and summer gains are considered, it will be seen that lot 1 made an average daily gain of 1.20 pounds at a cost of $7.60 and required a selling price of $7.38 per cwt. to come out even, while lot 2 made an average daily gain of 1.14 pounds at a cost of $8.72 per cwt. and required a selling price of $7.70 per cwt. to break even.

These steers were brought in from pasture in the fall and finished in the dry lot the following winter.

CONCLUSIONS

1. Steers receiving corn silage in their ration during the winter months made larger average gains the following summer on grass without grain than did the steers which received no silage during the winter.

2. In the first experiment the steers which received silage during the winter made 20 per cent larger gain on grass the following summer than the lot which did not receive silage during the winter. In the second experiment the steers which received silage during the winter made 66 per cent greater gain on pasture than did the steers which received no silage during the previous winter. In the third experiment the steers which received silage during the winter made 20.4 per cent less gain on pasture than did the steers which did not receive silage during the winter.

3. The combined winter and summer gains, with the exception of the first experiment, were greater with the steers which received silage during the winter. In the first experiment the

combined winter and summer gains of each lot were practically the same. In the second experiment the steers which received silage during the winter made 16.6 per cent greater winter and summer gains than the steers which received no silage during the winter. In the third experiment the steers which received silage during the winter made 4.5 per cent greater combined winter and summer gains than did the steers which received no silage during the winter.

4. In each of the three experiments, the total cost per cwt. gain was less with the steers which received silage during the winter. In the first experiment the cost of winter and summer gain was 12.5 per cent less with the steers which received silage during the winter than with those which did not receive silage in their ration. In the second experiment the cost per cwt. gain for the winter and summer gains was 38.9 per cent cheaper with the steers which received corn silage in their ration during the previous winter. In the third experiment the cost of the winter and summer gains was 12.8 per cent less per cwt. with the steers which received silage in their ration during the winter.

5. In the wintering of cattle that are to be fattened on pasture without grain the following summer, the second experiment indicates that it is more profitable to feed a heavy feed of silage with little or no corn than to allow a heavy feed of corn and a minimum amount of silage, as was the case in the first experiment.